



Traffic Guidelines Manual

ORIGINATOR Director, Bureau of Traffic Operations		4-2-20
CHAPTER 4	Signals	
SECTION 2	Traffic Control Signals	
SUBJECT 20	Emergency Vehicle Pre-emption	

A. General/Purpose

The following applies to the installation and operation of Emergency Vehicle Pre-emption (EVP) systems involving traffic control signals owned and operated by the Department.

B. Policy

Statutory Provisions

347.255 Auxiliary lamps on emergency vehicles used to activate traffic control signal pre-emption devices. (1) An authorized emergency vehicle described in s.340.01 (3)(a), (c), (g) or (l) *may* be equipped and operated with lamps designed and used solely to activate official traffic control signal pre-emption devices. (2) The lamps authorized for use under this section *may* be any color and *may* be flashing, oscillating, rotating or pulsating. (3) No operator of an authorized emergency vehicle *may* use such lamps except when responding to an emergency call, when pursuing an actual or suspected violator of the law or when responding to, but not when returning from, a fire alarm.

The above does not preclude actuation by means of devices other than lamps.

Eligibility

Any local governmental unit, agency, or organization having responsibility for providing emergency services is eligible to request an EVP system.

Request Procedure

The local unit **shall** make the request in writing to the Department. The following information *should* be included in the request:

1. Location of proposed EVP systems.

2. Location of emergency facilities (fire station, police station, etc.) where vehicles will be departing and description of the route to be provided with a pre-emption system.
3. Listing or estimate of number of vehicles to be outfitted.
4. Brand/Model of equipment being requested.

Approval

1. The Department **shall** review each request and respond in writing to the local unit as to the approval or denial of the request.
2. The Department *may* deny any request that it deems would have an overall negative impact on the traveling public.
3. If the local agency is requesting a brand/model of EVP other than the Department standard, the request must include a discussion about compatibility with neighboring agencies along the same corridor.
4. For approved requests, an official “EVP System Agreement” **shall** be prepared and approved by the Department and the local unit. Template is included at the end of this policy. This policy **shall** be included as a supplement to the agreement. Any special terms or conditions beyond the scope of this policy **shall** be stipulated in the agreement.
5. The Department *may* allow an indicator light that is intended to confirm to the driver of an emergency vehicle that the pre-emption signal has been received. The use of this device does not preclude the need of the vehicle operator to rely on the signal indications for assigned intersection right-of-way. Requests for such EVP confirmation lights *should* be reviewed on a case-by-case basis, and are subject to the following conditions:
 - a. The Department *may* deny any request for confirmation lights that it deems would have an overall negative impact on traffic safety or operations.
 - b. EVP confirmation lights **shall** only be installed at signalized intersections where:
 - i. Signal(s) on the STH system are embedded in a locally-owned system that is also equipped with confirmation lights. This implies consideration for route continuity, or
 - ii. Multiple emergency vehicles have the potential to respond on conflicting approaches and from different points of origin. These conditions will typically exist in large urban areas where there are multiple precincts in the same municipality.
6. EVP equipment that has the ability to discriminate between individual responding vehicles **shall not** be used.

7. In the event that it comes to the attention of the Department that the pre-emption is being misused, such as by unauthorized vehicles, or that the municipality is not using or intends to abandon the system, the Department *may* notify the municipality of the situation. If the matter is not resolved and corrected the Department reserves the right to set about removing the equipment. The Department will notify the municipality in writing as to its intent and give the scheduled date of removal of the equipment indicated in item 5 below.

Installation/Maintenance

1. Department forces **shall** perform the installation, maintenance, modification, or removal of the EVP system equipment that is located at the traffic signal. Generally, this equipment would include the receiving device (mounted on the mast arm or signal head), the phase selector (in the control cabinet), confirmation light, and any miscellaneous cables and wiring needed to operate and power the portion of the EVP system located at the signal.
2. The local unit will be responsible for the installation of the emitting devices in authorized vehicles.
3. The Department **shall** maintain a reasonable inventory of spare parts for the Department's selected standard equipment in order to service the EVP system equipment located at the traffic signal. If the local agency is requesting equipment other than the standard equipment, the local agency ***shall be responsible for maintaining and providing*** a reasonable inventory. Specify which in the agreement.
4. When notified, Department forces will respond to correct suspected failures or breakdowns, or perform requested modifications in the EVP system equipment at the traffic signal.
5. Upon the Department's request, the local unit will be responsible for verifying the working status of the EVP system by performing a "field test" using an emergency vehicle equipped with an EVP emitter device. The local unit is responsible for periodically checking the EVP equipment.
6. If used, the style and type of confirmation lights on of state- and locally-owned signals within each municipality **shall** be standardized. Confirmation Lights **shall** be a LED, 120 VAC, white, directional light that fits into a PAR 38 socket.
7. In the event of a construction project, EVP service **shall** be maintained at any intersection with permanent EVP agreements. In addition, EVP equipment may be installed, if requested by a local unit, at any additional signals within the construction project itself, or on a designated detour route in the event of a road closure.

Operation/Phase Timing

1. The Department **shall** determine the phasing and timing of the pre-emption sequencing with input from the local unit. There are three key features that must be considered when determining how the pre-emption will operate:
 - a. Left turn phasing (protected, protected/permissive, or permissive only)
 - b. Signal head configuration for left turning movement (shared vs exclusive head)
 - i. Shared heads: include both circular indications and arrow indications (used by through and turning vehicles)
 - ii. Exclusive heads: arrow indications only (used solely by turning vehicles)
 - c. Style of pre-emption sequencing (common greens vs. exclusive greens)
 - i. Common greens: indicates opposing through phases both have a green ball. The corresponding left turn phases are permissive only.
 - ii. Exclusive greens: indicates only one through movement and its corresponding left turn phase have the green ball/arrow.
2. The Department offers the following operational guidance based upon the combination of those three key features identified above:
 - a. Protected Only Left Turns
 - i. Exclusive Head
 1. **Shall** operate with exclusive greens for the safety and ease of turning of the pre-empting vehicle.
 - b. Permissive Only Left Turns
 - i. Shared Head
 1. Common greens
 - a. *May* be used.
 2. Exclusive greens
 - a. *May* be used if an all red period is introduced or a W25-2 sign is installed.
 - ii. Exclusive Head
 - a. **Shall** operate with common greens since a green left turn arrow is not available for use with exclusive greens.
 - c. Protected/Permissive Left Turns
 - i. Shared Head
 1. Common greens
 - a. *May* be used.
 2. Exclusive greens
 - a. *May* be used if an all red period is introduced or a W25-2 sign is installed.
 - ii. Exclusive Head
 1. Common greens
 - a. *May* be used.
 2. Exclusive greens
 - a. *May* be used.

3. Any exceptions to the guidance in item 2 above **shall** be included as part of the special terms or conditions of the agreement.
4. If used, the operation of confirmation lights on of state- and locally-owned signals **shall** be standardized such that the approach being preempted has a steady indication. Approaches with secondary calls **shall** flash. The flash rate **shall** not be between 5 and 30 flashes per second to avoid frequencies that might cause seizures.

Driver Training

1. The local unit **shall** be responsible for training the emergency services personnel on the proper operation of the system.
2. This training *should* provide clear understanding of these items:
 - a) The definition of an authorized emergency vehicle at the beginning of this policy.
 - b) The conditions when pre-emption *may* be used.
 - c) The use of pre-emption does not remove the responsibility of the vehicle operator from determining whether or not it is safe to enter the intersection.
 - d) The operator cannot assume that the pre-emption has gone into effect. The operator must rely on the traffic signal indication.
 - e) The proper operation of the activating device located on the vehicle.

Cost

1. The most common source of funding for a complete EVP system has been local funds or federal urban funds. However, EVP equipment at the traffic signal and installation may also be funded as part of an improvement project, provided it is incidental to the improvement. Please see Program Management Manual document 03-25-05 to determine the most appropriate source of funding.
2. The local municipality **shall** be responsible for all costs associated with the emitting devices for its authorized vehicles.
3. The Department **shall** be responsible for all material, equipment, labor, training, and incidental costs associated with maintaining, operating, modifying, or removing the EVP system at the traffic signal unless non-standard EVP system equipment is used. When non-standard equipment is installed, the local unit **shall** be the responsible for maintaining and supplying spare inventory to the Department.
4. Any cost associated with the continuance of service of an EVP system on temporary signals or on a temporary route during a construction project **shall** be borne by the project.

WISCONSIN DEPARTMENT OF TRANSPORTATION*Emergency Vehicle Pre-emption (EVP) System Agreement*

This is a binding agreement between the Wisconsin Department of Transportation and the

This agreement stipulates the terms and conditions for use of Emergency Vehicle Pre-emption (EVP) systems at the state-owned traffic control signal located at the intersection of

in the _____ of _____

Description of route: _____

Listing of estimated number of vehicles to be outfitted: _____

Inventory of spare EVP equipment shall be provided by WisDOT/Local Agency.

The Department's Policy for *Use of Emergency Vehicle Pre-emption (EVP) Systems at State-Owned Traffic Control Signals* is hereby made a part of this agreement (copy attached). The following special terms or conditions also apply to this agreement:

ACCEPTED FOR THE _____

BY _____ DATE _____ Local Government

TITLE _____

APPROVED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION

BY _____ DATE _____

TITLE _____